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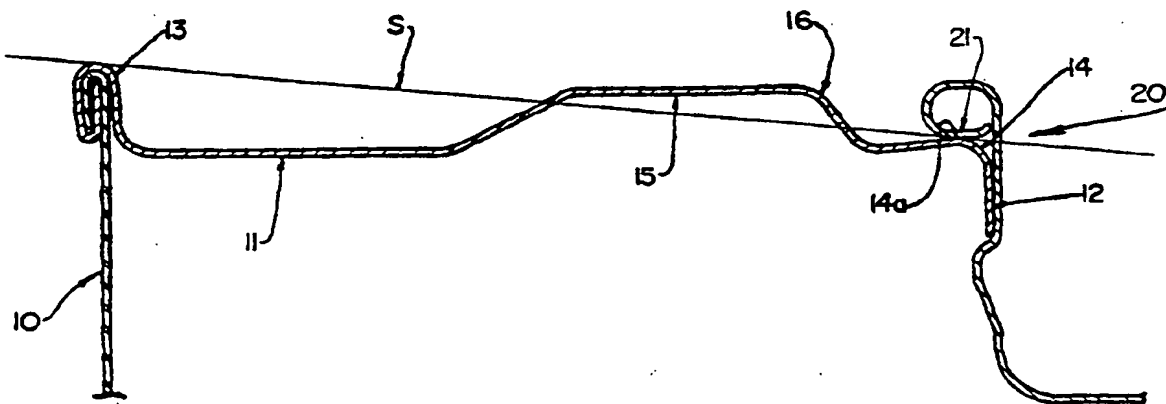
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With international search report.
With amended claims.

(54) Title: CAN WITH LARGE DISCHARGE UPPER OPENING



(57) Abstract

Can with large discharge upper opening (12), defined at a can upper wall (11), presenting an external peripheral edge (13) and an internal peripheral edge (14), and a median annular region (15), which defines a plastic deformable supporting point for a lever element used for opening a lid (20), adapted onto said discharge upper opening (12), the plastic deformation of the supporting point facilitating the recognition of any attempt made to open said lid.

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CAN WITH LARGE DISCHARGE UPPER OPENINGField of the Invention

5 The present invention refers to cans, having usually a capacity of eighteen liters and provided with a large discharge central opening, which occupies a substantial portion of the area of the can upper wall. More particularly, the present invention refers to an
10 improvement at the upper wall of said cans.

Background of the Invention

The large cans of usually eighteen liters, which are used for storing bulk products, present at their upper wall a central opening, which occupies a large area.
15 The closing of said cans is achieved by applying a lid onto said opening, in order to avoid loss of the content stored within the cans, regardless of the position of said cans. Such lids present a reinforced peripheral edge, in order to prevent said lids from
20 suffering damages during the opening of the can, thereby avoiding said opening. This reinforcement is calculated in order to give further strength to the lid.

In this construction, the peripheral edge of the lid is
25 seated against a corresponding lid seating portion, which is defined at the edge of the central opening and which is projected onto an upper wall portion of said can, said portion being disposed at a lower plan in relation to that reinforced peripheral edge of the can,
30 thereby allowing said peripheral edge to act as a supporting point for the application of a lever to be used to remove said lid during the opening of the can. Due to this construction, the opening of said cans is easily achieved, without causing any damages to the
35 can, and without leaving any vestiges caused by the introduction of a free end of a lever element between the peripheral edge of the lid and its seat at the

central opening.

Such easiness and discretion for opening the can allows the improper opening of said can, with the purpose of adulterating its content, for example. Moreover, as
5 the supporting point for the lever element used to open the can is defined away from the point where force is applied to raise the lid edge, it will be required from the user a certain physical effort to open said can.

Disclosure of the Invention

10 Thus, it is an object of the present invention to provide an upper wall for usually eighteen-liter cans, which are cylindrical or parallelepipedic, and which are provided with a discharge upper opening, occupying a large area of said can upper wall, which is conformed
15 so as to avoid violations of the content, by the improper opening of the lid.

It is also an object of the present invention to provide an upper wall for cans as described above, which allows the identification of attempts to violate
20 the content of said cans, when their lids are opened.

It is a further object of the present invention to provide a construction of the upper wall of a can of the above described type, which requires less effort from the user to open the lid.

25 These and other objects and advantages of the present invention are achieved through a can, having a large discharge upper opening, which is defined at an upper wall of said can, presenting an external peripheral edge and an internal peripheral edge, said upper wall
30 presenting, between a median annular region of its radial extension and its internal peripheral edge, an annular step defining a seat for a peripheral edge of a lid to be adapted onto said discharge opening, said step being joined to the upper wall through an internal
35 edge of said median annular region of said upper wall, said internal edge being disposed above a straight line

S, which is simultaneously tangent to the external peripheral edge and to the internal peripheral edge of said upper wall.

Brief Description of the Drawings

- 5 The invention will be described below, with reference to the attached drawings, in which:
- Fig. 1 is a frontal-lateral perspective view of a parallelepipedic can of the type herein described;
- Fig. 2 is a partial cross sectional view of the upper wall of a can with a large discharge upper opening, which is closed by a lid according to the prior art;
- 10 Fig. 3 is a view similar to that of figure 2, of a can upper wall portion, according to the present invention; and
- 15 Fig. 4 is a partial cross sectional view of the upper wall of a cylindrical can, whose large upper discharge opening is covered by a lid, according to another embodiment of the invention.

Best Mode of Carrying Out the Invention

- 20 According to the figures 1, 2 and 3, there is illustrated a usually eighteen-liter can 10, which may alternatively present much or less capacity and which is substantially parallelepipedic, provided at its discharge upper end wall 11 with a discharge opening
- 25 12, which is substantially circular, occupying a substantial portion of the total area of the respective upper wall 11, and which is covered by a lid 20.

In another embodiment, illustrated in figure 4, the can 10 may present a cylindrical shape, whereas the

30 discharge opening may present any oval or polygonal form, provided that there is defined at the upper wall 11 a radial spacing between an external peripheral edge 13 and an internal peripheral edge 14, which defines the discharge opening 12.

- 35 At the construction of the prior art (illustrated in figure 2), the external peripheral edge 13 of the upper

wall 11 is joined to an internal peripheral edge 14 through an annular portion of the upper wall 11, said internal peripheral edge defining a seat for a peripheral edge 21 of the lid 20. The annular portion of the upper wall 11 is integrally disposed below a straight line S, which is simultaneously tangent to the external peripheral edge 13 and to the internal peripheral edge 14. With this disposition, the external peripheral edge 13 of the upper wall 11 is able to function as a supporting point for a lever element, in the form of a screw driver (non illustrated), for example, to be used for opening the lid 20.

In the construction illustrated in figure 2 (prior art), the internal peripheral edge of the upper wall 11, which defines a seat 14 for the peripheral edge 21 of the lid 20 is defined by a rounded shoulder of the internal peripheral edge of the can upper wall 11, said shouldered seat 14 being disposed at a horizontal plane, coplanar or inferior relative the plane of the external peripheral edge 13 of the upper wall 11. In this condition, the external peripheral edge 13 can be used as a support for a lever element, whose tapered free end is introduced between the seat 14 and the peripheral edge 21 of the lid 20, in order to open said lid.

This construction permits the easy violation of the content provided within the can 10, due to the facility to open said can 10, without leaving local vestiges (external peripheral edge 13), where the opening tool is supported. It should be understood that the external peripheral edge 13 of the can 10 is constructed in such a way as to make this region very resistant to deformations, as illustrated in the embodiment of figures 2, 3 and 4.

According to the present invention (see figure 3 and

4), the upper wall 11 is conformed so as to present, between its external peripheral edge 13 and the discharge opening 12, a median annular region 15, which presents at least part of its extension disposed above
5 the line S that is simultaneously tangent to the external peripheral edge 13 and to the internal peripheral edge 14 of the upper wall 11.

In the construction illustrated in figures 3 and 4, the upper wall 11 presents its internal peripheral edge 14
10 defining the contour of the discharge opening 12 and being disposed at a lower level to that of the median annular region 15 and substantially coplanar to the upper wall 11 in the embodiment illustrated in figure 3. The internal peripheral edge 14 defines an annular
15 step 14a of rounded corners and lowered in relation to an internal edge 16 of the median annular region 15, said step 14a defining, at this region of the upper wall 11 that surrounds the discharge opening 12 a seat for the peripheral edge 21 of the lid 20, during the
20 closing of the discharge opening 12. According to the construction illustrated in figures 3 and 4, the annular step presents a radially outermost portion, which is slightly lowered, so as to facilitate the adaptation of the lever element under the peripheral
25 edge 21 of the lid 20, when said lever element has its end introduced between the internal edge 16 of the annular region 15 and the peripheral edge 21 of the lid 20. The internal edge 16 of the annular region 15 is preferably radially spaced away from the peripheral
30 edge 21 of the lid 20, in order to make even easier the adaptation of the free end of the lever element during the opening of the can 10, as described above.

The internal edge 16 of the annular region 15 acts as a supporting point for the lever element during the
35 opening of the lid 20. It should be observed that the small radial spacing between the internal edge 16 of

the annular region 15 and the peripheral edge 21 of the lid 20, the large relative radial spacing between the external peripheral edge 13 and the projection of said internal edge 16 over the straight line S, simultaneously tangent to the external peripheral edge 13 and to the internal peripheral edge 14 of the upper wall 11, make the lever element be only supported on said external peripheral edge 13 during the opening of the lid 20, after a substantial and visible deformation caused at the internal edge 16 of the annular region 15.

According to the present invention, this internal edge 16 is constructed in such a way as to be deformed when force is applied onto the lever element, during the opening of the lid 20, thereby allowing the easy visualization of the attempt to violate the content of the can 10.

This easiness to detect a possible violation results from the fact that the supporting point for the application of a lever element is defined at a region close to the lid 20, which is of a more fragile construction than that of the external peripheral edge 13 of the upper wall 11. Due to this fragility, any force applied onto the internal edge 16 of said annular region 15 will result in a deformation of said internal edge 16, which deformation is difficult to correct or to camouflage.

In order to protect said region against undesirable deformations caused during, for example, the transportation of the cans of the above described type, the annular region 15 is preferably coplanar or lowered in relation to the external peripheral edge 13 of the upper wall 11. Nevertheless, said construction foresees that, even if the deformation of the internal edge 16 changes the supporting point for the application of a lever element, there will not be any

obstructions for the opening of the lid 20.

- Although not illustrated, other embodiments are possible due to the constructive characteristics of the can 10, provided that said embodiments do not result in
- 5 transferring the supporting point for the application of force to open the lid to the external peripheral edge 13, i.e., provided that the internal edge 16 of the annular region 15 is kept above the straight line S.
- 10 In order to improve the visualization of the attempts to violate the can 10, there can be applied or adhered onto the internal edge 16, by any adequate means, a visually enhanced thin film, which can be easily broken when the lever element is placed between said internal
- 15 edge 16 and the peripheral edge 21 of the lid 20.

CLAIMS

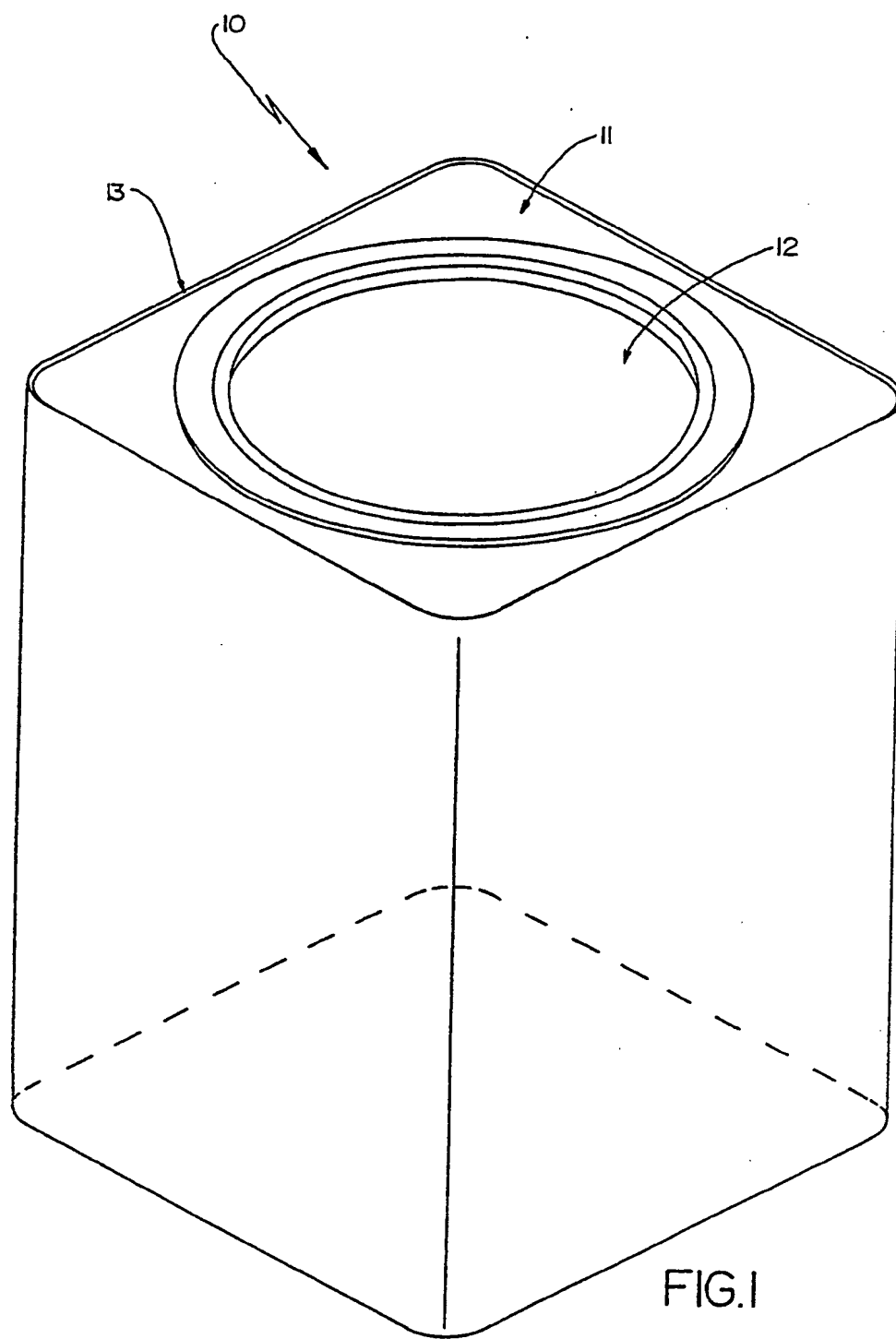
1. Can with large discharge upper opening (12), said discharge opening (12), which is defined at a can upper wall (11), presenting an external peripheral edge (13) and an internal peripheral edge (14), characterized in that the upper wall (11) presents, between a median annular region (15) of its radial extension and its internal peripheral edge (14), an annular step (14a), defining a seat for a peripheral edge (21) of a lid (20) to be adapted onto said discharge opening (12), said step being joined to the upper wall (11) through an internal edge (16) of said median annular region (15) of said upper wall (11), said internal edge (16) being disposed above a straight line S, which is simultaneously tangent to the external peripheral edge (13) and to the internal peripheral edge (14) of said upper wall.
2. Can, according to claim 1, characterized in that the annular step (14a) presents a radially outermost portion, which is lowered in relation to the internal peripheral edge (14) of the upper wall (11).
3. Can, according to claim 1, characterized in that the median annular region (15) is elevated in relation to the radially outermost portion of the upper wall (11), except for the external peripheral edge (13) thereof.
4. Can, according to claim 3, characterized in that the internal edge (16) of the median annular region (15) is radially spaced from the peripheral edge (21) of the lid (20) when mounted.
5. Can, according to claim 1, characterized in that the internal peripheral edge (16) of the median annular region (15) receives a visually enhanced film, which is broken when the lid (20) is opened.

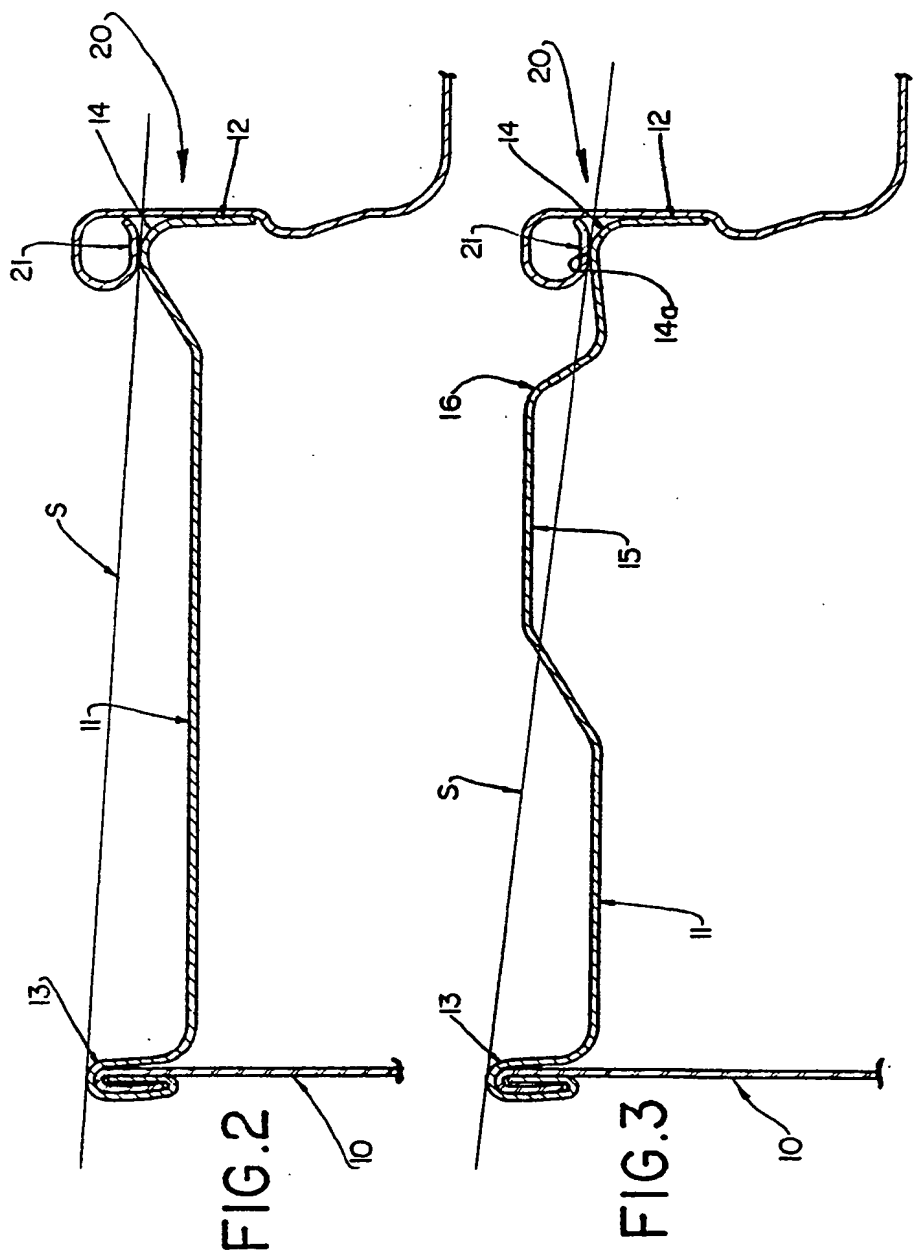
AMENDED CLAIMS

[received by the International Bureau on 6 January 1995 (6.01.95);
original claims 1-5 replaced by amended claims 1-3 (1 page)]

1. Can with large discharge upper opening (12) defined
5 at a can upper wall (11) which presents an external
peripheral edge (13), an internal peripheral edge (14)
and between a median annular region (15) of its radial
extension and its internal peripheral edge (14), an
annular step (14a), defining a seat for a peripheral
10 edge (21) of a lid (20) to be mounted onto said
discharge opening (12), said can upper wall (11) also
defining a supporting point for the application of a
lever to be used to raise said lid peripheral edge (21)
during the opening of the can, characterized in that
15 said annular step (14a) is joined to the upper wall
(11) through an internal edge (16) of said median
annular region (15), said internal edge (16) being
disposed radially and outwardly spaced from the
peripheral edge (21) of the lid (20) in its mounted
20 position and above a straight line S, which is
simultaneously tangent to the external peripheral edge
(13) and to the internal peripheral edge (14) of said
upper wall, said internal edge (16) defining a visible
deformable provisional supporting point for the lever
25 during the opening of the lid.
2. Can, according to claim 1, characterized in that the
annular step (14a) presents a radially outermost
portion, which is lowered in relation to the internal
peripheral edge (14) of the upper wall (11).
- 30 3. Can, according to claim 1, characterized in that the
median annular region (15) is elevated in relation to
the radially outermost portion of the upper wall (11),
except for the external peripheral edge (13) thereof.

1/3





3/3

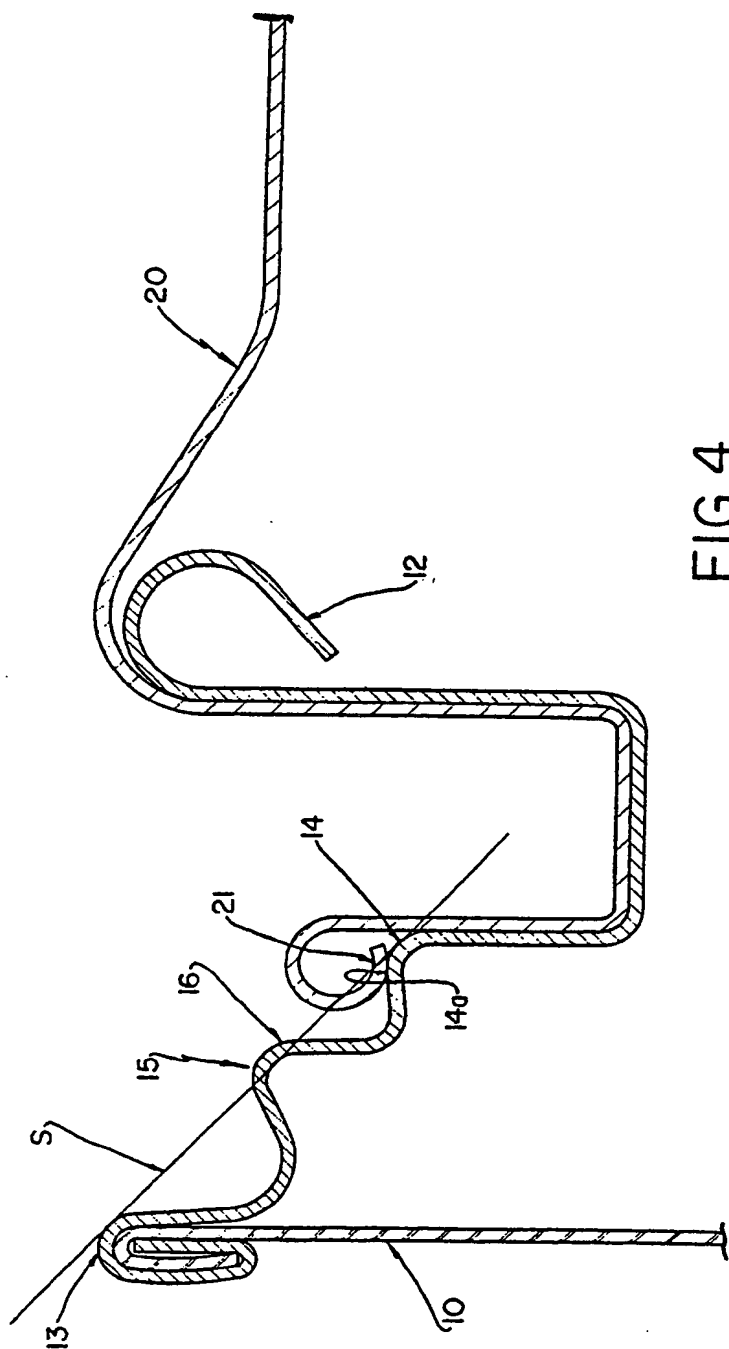


FIG. 4

INTERNATIONAL SEARCH REPORT

Inter. Appl. Application No
PCT/BR 94/00002

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B65D43/04 B65D43/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US,A,1 696 388 (DAVID W. CURTIS) 25 December 1928 see figure 1 -----	1,2 3,4

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
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- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

26 July 1994

Date of mailing of the international search report

09. 11. 94

Name and mailing address of the ISA

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Authorized officer

MARTIN A.G.M.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/BR 94/ 00002

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. Claims 2-4: to further specify the upper discharge opening.
2. claim 5: to add a visually enhanced

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter. onal Application No

PCT/BR 94/00002

Patent document
cited in search report

Publication
date

Patent family
member(s)

Publication
date

US-A-1696388

NONE

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